Including System Values in Cost Tests for Energy Efficiency

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A note on terminology

- Benefit/Cost suggests a fraction
  - Easy to understand
- If Benefits of a measure exceed Costs, then the fraction will be greater than 1
- Apply to "**measures**," and then to "**programs**" which deliver those measures

Why Measure Cost-Effectiveness?

- Guidance – decision-makers, not B/C test, should decide:
  - Is an efficiency measure or program warranted?
  - Should a program be continuous or time-limited?
  - What combination of programs and program budget allocations offers the best value?
  - What are motivations of customers and service providers?
  - How to manage and make adjustments over time?
  - How to evaluate success compared with objectives?

Tests Should Match Public Values

- What is Energy Efficiency for?
  - Customer Rates – Least Cost in Long Run
  - Participating Customers Save Money, Satisfied
  - Utility Financials: manage, minimize risk
  - Utility System Resources: slow needs
  - Society (beyond the utility system)
- Reservoir of cost-effective energy efficiency is different depending on perspective

Some Elements of Cost-Effectiveness

- Life-cycle – requires assessment of average measure life
- Start-up Costs may be higher in early years
- Free riders – minimize, can't eliminate, appropriate discount
- Persistence – characterize by program for evaluation with appropriate discount
- Free drivers – participating customers motivated to do more
- Capacity/Ancillary value – Reduce peak needs, losses and reserves

Alternatives

- Tests (California Manual is authoritative source)
  - Rate Impact Measurement
  - Participant
  - Utility Cost
  - Total Resource Cost
  - Societal (can include air quality, water, other factors of public value)
- Some jurisdictions use several tests for different purposes, others focus on just one

Efficiency Costs and Saves

- If sales are reduced from what they otherwise would have been faster than costs are reduced from what they otherwise would have been, rates go up from what they otherwise would have been
- If sales are reduced from what they otherwise would have been, new generation and transmission and their costs can be delayed or avoided

Cost-Effectiveness Tests

- Choice communicates priorities of the state
  - RIM Test is concerned for rates, ignores the system benefits of efficiency
  - Total Resource Cost Test considers system benefits, ignores external benefits
  - Societal Test considers everything
- Using TRC or societal test could produce cost-effective programs that can **save 1.5-2% of total sales and capacity each year**. Regulator gets to decide what consumers and the state economy can afford, and what cost-effective programs to sacrifice, if any, and to recognize the capital consequences.

Policy Considerations

- High priority programs may have lower B/C threshold
  - Low income or hard to reach customers
- Some states have a minimum B/C criterion for the total EE portfolio of programs, and a lower minimum for certain priority programs

Inputs

- Program costs, including participant costs
- Avoided costs
  - Market costs
  - Commodity + generation (busbar) costs
  - Transmission and Distribution
- Adjustments
  - Air quality
  - Water

Some Observations on the RIM Test

- The RIM test is not used to evaluate supply-side investments
  - The TRC (or societal) test is used, implicitly or explicitly, for other utility investments
  - Only short-term load management activities satisfy RIM
  - Whole building programs, packaging multiple measures coherently fail RIM because they save too much energy
- Use of RIM assumes that price alone is sufficient to inform consumers about efficient choices
  - Ignores well-documented and significant barriers to adoption of energy efficiency
  - It also assumes that the price *ex ante* is more efficient than the price *ex post*
- Use of RIM assumes that economic efficiency is served by no change in price
  - Economic efficiency is maximized when total cost to serve a given level of demand is minimized
  - Under conditions of natural monopoly, significant barriers to efficient investment, and substantial unpriced external costs, minimizing price does not equate to minimizing total cost.
  - Agreed: politics and public interest of industrial rates is important

Iowa Utilities Board Benefit/Cost Analysis

- Commission sees all perspectives, Societal is defining test for programs and plans
- Discount rate tied to U.S. Treasury bonds
- “Adders” to avoided cost for externalities
- Free riders vs. “free drivers” is a wash
- Low-income exempt from B/C by statute